

Abstract Submitted
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Efficient adsorbate transport by electron wind: The role of resonant photoexcitation KIRILL VELIZHANIN, DMITRY SOLENOV, Los Alamos National Laboratory — We study the surface electromigration force acting on an organic molecule at a conducting (metal) surface. The dominant contribution to the force comes from the scattering of metallic electrons off the molecule, as they tunnel to and from nearby molecular orbitals. When metal carries non-zero current, the net force is directed with the current flow. This force, however, is often too small for efficient transport of adsorbed molecules and only reveals itself through a contribution to the metal resistivity. We show that surface-molecule electron wind force can be substantially enhanced and controlled by exploiting appropriate resonances between molecular and metallic states activated by coherent light. This effect opens a path to new surface-molecule functionality, including high resolution spatially controlled force patterns, controlled molecule motion, etc.

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